IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Robert Aigner et al.
Serial No.:	10/808,949
Date Filed:	March 25, 2004
Examiner:	Anthony D. Tugbang
Group Art Unit:	3729
Title:	**A METHOD OF PRODUCING A PIEZOELECTRIC COMPONENT**

MAIL STOP – APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Further to the notice of appeal submitted on October 21, 2005, Appellants hereby submit this appeal brief according to §41.37.

APPELLANT'S BRIEF (37 C.F.R. § 41.37)

This brief is submitted in support of Appellants' notice of appeal from the decision dated October 11, 2005 of the Examiner finally rejecting claims 1-40 of the subject application.

I. REAL PARTY IN INTEREST

The real party in interest is:

Infineon Technologies AG
St.-Martin-Str. 53
Munich, GERMANY 81669

by virtue of an assignment as duly recorded in the Assignment Branch of the U.S. Patent and Trademark Office.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

The application as originally filed contained 30 claims (claims 1-30). Claim 1 has been amended, Claim 2 has been canceled, and Claims 3-30 have been withdrawn due to an election restriction requirement. Claims 31-40 were newly added during prosecution in a Response to Office Action mailed May 6, 2005, however, were withdrawn by Examiner in the Final Office Action mailed July 27, 2005. Thus, claims 1 and 3-40 are pending. Claims 3-40 are withdrawn from consideration. Claim 2 was cancelled. Claim 1 has been rejected. Appellants appeal the rejection of the claims of the present application. These claims are reproduced in Appendix A.

IV. STATUS OF AMENDMENTS

A first office action was issued August 27, 2004 in which claims 1-30 were subject to an election/restriction requirement. Appellants submitted a response to office action mailed September 22, 2004 electing to prosecute Claims 1-9. Claims 10-30 were withdrawn without prejudice. A second office action was issued December 14, 2004, withdrawing the previous election/restriction requirement dated August 27, 2004, and in which Claims 1-30 were subject to a new election/restriction requirement, along with a Species election requirement. Appellants submitted a response to the second office action mailed January 5, 2005 electing to prosecute Claims 1-9 and Species A drawn to forming an opening in the piezoelectric layer, Claim 2.

A third office action was issued February 8, 2005 in which Claim 1 was objected to due to informalities, and also rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 3,590,287 issued to Don A. Berlincourt ("Berlincourt"). Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Berlincourt in view of U.S. Patent 4,503,350 issued to Hiroshi Nakatani Nakatani ("Nakatani"). Appellants filed a response May 6, 2005, arguing patentability of all pending claims, amending Claim 1, canceling Claim 2, and adding new Claims 31-40. A final office action was issued July 27, 2005, where the Examiner withdrew Claims 31-40 for being directed to an invention independent or distinct from the invention originally claimed. Claim 1 was rejection under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,263,550 issued to Dieter Seipler et al. ("Seipler") in view of Berlincourt. Appellants filed a response to the final office action mailed September 26, 2005, arguing patentability of Claim 1, and requesting reinstatement of Claims 31-40.

An Advisory Action was issued October 11, 2005 in which the rejections in the final office action were maintained and newly added Claims 31-40 were not reinstated. Appellants filed a Notice of Appeal on October 21, 2005. The status of the claims are as follows:

Claims allowed:	none	Claims cancelled:	2
Claims rejected:	1	Claims Withdrawn:	31-40
Claims objected:	none		

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to piezoelectric components comprising at least two stacked crystal filters, and to a method for producing such piezoelectric components.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claim 1 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,263,550 issued to Dieter Seipler et al. ("Seipler") in view of Berlincourt. However, Appellants do not believe that the cited references teach all the limitations of Claim 1, and anticipate the claimed invention.

VII. ARGUMENT

The Examiner stated that the references Seipler and Berlincourt each are considered by one of ordinary skill in the art to be in the same technical field with applicant's own invention because they both are directed to stacked piezoelectric layers and each reference is reasonably pertinent to the particular problems associated with stacked piezoelectric layers manufactured for a piezoelectric component. Applicants respectfully disagree.

For a proper rejection under 35 U.S.C. §103, it has to be determined what is prior art. To this end, two criteria have evolved, (1) whether the art is from the same filed of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *In re Deminski,* 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986); *In re Wood,* 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979). The present invention is directed to "a piezoelectric component containing at least two stacked crystal filters" and not to a piezoelectric component per se. The body of the claim includes the language "*producing second openings in at least the third electrically conductive layer in such a way that at least two stacked crystal filters are produced.*" Thus Applicants' invention is directed to stacked crystal filters using piezoelectric layers. The fact that the claim uses the term "piezoelectric component" does not automatically define the technical field of the invention and, thus, include any type of piezoelectric device within this

technical field. Moreover, the claim language limits the term "piezoelectric component" to such components that include at least "two stacked crystal filters." The claim is, thus, clearly directed to stacked crystal filters. Stacked crystal filters are not related to piezoelectric actuators. A piezoelectric actuator is used to provide for mechanical movement whereas a stacked crystal filter is used in an electronic circuit, for example, to limit or select a predefined bandwidth. Thus, a piezoelectric actuator is not within the same field of endeavor.

Moreover, a piezoelectric actuator as disclosed in Seipler is not reasonably pertinent to the particular problem of producing stacked crystal filters. Such crystal filters are used in mobile communication whereas piezoelectric actuators are used, for example, in fuel injectors in a combustion engine. These technologies are so far from each other that a person of ordinary skill in the art would not be motivated to combine any type of aspect of these technologies.

Hence Applicants believe that Seipler is not proper prior art and, therefore, a person skilled in the art would not combine Seipler with Berlincourt.

Moreover, Seipler does not disclose the step of producing second openings in at least the third electrically conductive layer in such a way that at least two stacked crystal filters are produced. The Examiner stated that Seipler shows the "second openings in form of any of the openings 11, 12,13. However, the claim clearly states that the second openings are formed in such a way that at least two stacked crystal filters are produced. These openings are shown in Fig. 1E of the present application and they create the two stacked crystal filters 30 and 32.

The openings of Seipler do not create two stacked crystal filters because Seipler is not related art as stated above. Moreover, these openings are not creating two separate entities at all, for example, two actuators. Thus, it is unclear how Seipler at least teaches to create two devices by means of the openings 11, 12, 13. Seipler merely teaches to create openings to provide for connecting of the different layers. Seipler does not teach to use openings to divide a device into two separate devices. Moreover it is completely unclear in what a combination of Seipler and Berlincourt would result. Even if these references were combined by a person skilled in he art, which Applicants do not concede, such a combination would not

even remotely result in two stacked crystal filters. Due to the fact that Seipler does not teach to separate a piezoelectric stack into two stacks, a combination of Seipler and Berlincourt will not result in two stacked crystal filters.

Thus, Applicants respectfully request allowance of independent claim 1 in view of the prior art.

SUMMARY

Appellants authorize the Commissioner to charge $500.00 for the Appeal Brief to Deposit Account No. 50-2148 of Baker Botts L.L.P.. Appellants believe there are no additional fees due at this time, however, the Commissioner is hereby authorized to charge any fees necessary or credit any overpayment to Deposit Account No. 50-2148 of Baker Botts L.L.P.

Respectfully submitted,

BAKER BOTTS L.L.P. (31625)

Date: May 31, 2006

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APPENDIX A - CLAIMS INVOLVED IN APPEAL

Claims:

1. (Previously Presented) A method for producing a piezoelectric component containing at least two stacked crystal filters, comprising the following steps:

a) providing a substrate;

b) producing at least one bottom electrode on the substrate from a first electrically conductive layer applied on the substrate;

c) applying a layer stack on the substrate at least in a region of the bottom electrode, in which the layer stack comprises, beginning with the bottommost layer, a first piezoelectric layer, a second electrically conductive layer, a second piezoelectric layer and a third electrically conductive layer;

d) producing at least a first opening in the third electrically conductive layer and the second piezoelectric layer to provide a contact hole for the second electrically conductive layer, and producing second openings in at least the third electrically conductive layer in such a way that at least two stacked crystal filters are produced;

e) contact-connecting the third electrically conductive layer.

2. (Canceled)

3. (Withdrawn) The method as claimed in claim 1, wherein, before step e), the resonant frequency of at least one of the stacked crystal filters produced is measured and, if appropriate, in a further step, the layer thickness of the third electrically conductive layer is corrected by local etching-away.

4. (Withdrawn) The method as claimed in claim 1, wherein, before step d) and/or e), at least one upper acoustic mirror is produced, preferably from a layer stack applied on the third electrically conductive layer, the layer stack having at least one layer made of an electrically conductive metal and preferably all the layers of the layer stack being electrically conductive.

5. (Withdrawn) The method as claimed in claim 4, wherein the upper acoustic mirror comprises a layer sequence of electrically conductive metals which alternately have a high and low acoustic impedance.

6. (Withdrawn) The method as claimed in claim 1, wherein the first and second piezoelectric layer have different layer thicknesses.

7. (Withdrawn)The method as claimed in claim 1, wherein, before step b), a lower acoustic mirror is produced in the substrate.

8. (Withdrawn) The method as claimed in claim 7, wherein the lower acoustic mirror comprises a lower sequence made of materials having alternately a high and a low acoustic impedance.

9. (Withdrawn) The method as claimed in claim 1, wherein the bottom electrode, the first piezoelectric layer, the central electrode, the second piezoelectric layer and the top electrode are deposited in such a way that the layer stack formed from these layers has a layer thickness which corresponds approximately to half the wavelength of the mechanical oscillation of the stacked crystal filters.

10. (Withdrawn) A piezoelectric component comprising at least two stacked crystal filters on a substrate, each stacked crystal filter comprising at least one bottom electrode, a first piezoelectric layer arranged above the bottom electrode, a central electrode arranged above the first piezoelectric layer, a second piezoelectric layer arranged above the central electrode, and a top electrode arranged above the second piezoelectric layer, wherein at least two of the respective bottom and of the respective central electrodes of the stacked crystal filters are directly connected to one another.

11. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the bottom electrodes are ungrounded.

12. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the electrical potential of the bottom electrodes is not defined.

13. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the bottom electrodes of at least two stacked crystal filters which are directly connected to one another and their respective direct connection are formed from one layer.

14. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the central electrodes of at least two stacked crystal filters which are directly connected to one another and their respective direct connection are formed from one layer.

15. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the top electrodes of the stacked crystal filters, which are directly connected to one another via their bottom electrodes are used as signal input or signal output.

16. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one lower acoustic mirror.

17. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein at least one upper acoustic mirror is arranged above the top electrodes.

18. (Withdrawn) The piezoelectric component as claimed in claim 17, wherein the upper acoustic mirror is formed from at least one electrically conductive material.

19. (Withdrawn) The piezoelectric component as claimed in claim 18, wherein the upper acoustic mirror is directly conductively connected to the top electrodes.

20. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one contact hole, which extends through the top electrode and the upper piezoelectric layer and via which the central electrode can be connected to a predetermined potential by means of at least one electrically conductive material.

21. (Withdrawn) The piezoelectric component as claimed in claim 20, wherein the same electrically conductive material is used for connecting the central electrode to the predetermined potential as for forming the upper acoustic mirror.

22. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one two-stage single-ended narrowband filter, comprising a first stacked crystal filter, the top electrode of which is connected as signal input, a second stacked crystal filter, the top electrode of which is connected as signal output, the central electrodes being grounded.

23. (Withdrawn) The piezoelectric component as claimed in claim 22, wherein the piezoelectric component comprises at least two series-connected two-stage single-ended narrowband filters.

24. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one impedance transformer, comprising a first stacked crystal filter, the top electrode of which is connected as signal input, a second stacked crystal filter, the top electrode of which is connected as signal output, the central electrodes of the stacked crystal filters being grounded, and the impedance of the first stacked crystal filter being less than the impedance of the second stacked crystal filter.

25. (Withdrawn) The piezoelectric component as claimed in claim 24, wherein, in the first and second stacked crystal filters, the first piezoelectric layer is thinner than the second piezoelectric layer.

26. (Withdrawn) The piezoelectric component as claimed in claim 24, wherein the bottom and the top electrodes have a different areal form and/or areal content.

27. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one power divider, comprising at least a first, second and third stacked crystal filter, the top electrode of the first stacked crystal filter being connected as signal input and the top electrodes of the second and third stacked crystal filters in each case being connected as signal output, the bottom electrodes and the central electrodes of the first, second and third stacked crystal filters being directly connected to one another and the central electrodes being grounded.

28. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein the piezoelectric component comprises at least one balanced filter, comprising four stacked crystal filters, the central electrodes of which are directly connected to one another and the bottom electrodes of each two stacked crystal filters are directly connected to one another, thereby forming two stacked crystal filter pairs, and, in each stacked crystal filter pair, one top electrode is connected as signal input and one top electrode is connected as signal output.

29. (Withdrawn) The piezoelectric component as claimed in claim 28, wherein the central electrodes are grounded.

30. (Withdrawn) The piezoelectric component as claimed in claim 10, wherein, in at least one of the stacked crystal filters of the component, the first electrode, the first piezoelectric layer, the central electrode, the second piezoelectric layer and the top electrode form a layer stack, whose layer thickness corresponds approximately to half the wavelength of the mechanical oscillation of the stacked crystal filter.

31. (NEW) The method as claimed in claim 1, wherein, before step e), the resonant frequency of at least one of the stacked crystal filters produced is measured and in case correction of the resonant frequency is required in a further step, the layer thickness of the third electrically conductive layer is corrected by local etching-away.

32. (NEW) The method as claimed in claim 1, wherein, before step d) and/or e), at least one upper acoustic mirror is produced.

33. (NEW) The method as claimed in claim 32, wherein the upper acoustic mirror comprises a layer stack applied on the third electrically conductive layer, the layer stack having at least one layer made of an electrically conductive metal.

34. (NEW) The method as claimed in claim 33, wherein the at least one layer made of an electrically conductive metal fills the contact hole.

35. (NEW) The method as claimed in claim 33, wherein all the layers of the layer stack are electrically conductive.

36. (NEW) The method as claimed in claim 35, wherein the upper acoustic mirror comprises a layer sequence of electrically conductive metals which alternately have a high and low acoustic impedance.

37. (NEW)The method as claimed in claim 1, wherein the first and second piezoelectric layer have different layer thicknesses.

38. (NEW) The method as claimed in claim 1, wherein, before step b), a lower acoustic mirror is produced in the substrate.

39. (NEW) The method as claimed in claim 38, wherein the lower acoustic mirror comprises a lower sequence made of materials having alternately a high and a low acoustic impedance.

40. (NEW) The method as claimed in claim 1, wherein the bottom electrode, the first piezoelectric layer, the central electrode, the second piezoelectric layer and the top electrode are deposited in such a way that the layer stack formed from these layers has a layer thickness which corresponds approximately to half the wavelength of the mechanical oscillation of the stacked crystal filters.

APPENDIX B - EVIDENCE

NONE

APPENDIX C: RELATED PROCEEDINGS

NONE